

Reliability & Maintainability (R&M) Web Links

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Web Link	Description	Policy	Processes	Standards	Tools	Techniques	Training	Consulting	Assessments
https://solar.msfc.nasa.gov/solar/delivery/public/html/newindex.htm	NASA's "Site for On-line Learning and Resources (SOLAR)" provides training on the basic concepts of R&M at NASA. Click "Training Disciplines" and "Safety and Mission Assurance" to find courses such as: R&M Overview, R&M and the xxx Subprocess, FMEA/CIL, Fault Tree Analysis, Testing, Risk Management Overview, and Lessons Learned Information System (LLIS).						X		
http://www.engineeredsoftware.com/nasa/default.htm	Engineered Software, Inc's training with examples on the basic mathematics of R&M . This training supports the "R&M Analyst" software tool that is licensed to all personnel at Kennedy Space Center.						X		
http://standards.nasa.gov/	NASA's Technical Standards Program. To locate R&M standards: (1) Log in and (2) Click "Agency wide Full-Text Technical Standards System." To locate the international standards related to R&M, enter "dependability" in the "Title Key Word(s)" field and compare the results of searches that use only the words "reliability" and/or "maintainability."			X					
http://www.hq.nasa.gov/office/codeq/87291.pdf	A NASA's technical standard (NASA-STD-8729.1) that provides guidance on planning, developing, and managing effective R&M programs . Based on NPG7120.5.		X	X		X			
http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8720_001_B_&page_name=main	NASA's R&M program policy (NPD 8720.1).	X							
http://www.hq.nasa.gov/office/codeq/rm/prefprac.htm http://llis.gsfc.nasa.gov/	NASA's Reliability Preferred Practices for Design and Test (first link). Updates to the source in the first link are available in the second link, NASA's Lessons Learned Information System (LLIS).			X		X			
http://www.hq.nasa.gov/office/codeq/doctree/praguide.pdf	NASA's guide on Probabilistic Risk Assessment (PRA) . PRA integrates various safety and reliability techniques (e.g., event trees, event-sequence diagrams, fault trees, and possibly operating/failure data). PRA is best at identifying and assessing risks in complex systems especially when system data is not available or known.					X	X		

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http://stic.jsc.nasa.gov/dbase/dis/jsc/jsc28549a.doc	NASA JSC's requirements for R&M data analysis and assessment of space shuttle and other spacecraft elements (JSC28549). The quantitative techniques require system operating/failure data.			X		X			
http://sma.jsc.nasa.gov/tal/ <u>Note:</u> The report may be under either the "Current" or "Archived" link.	NASA Space Shuttle Program's (SSP) Orbiter quantitative analyses at 3 levels (trending and risk prioritization of all systems, system Pareto analyses, and comprehensive R&M analyses). For R&M training purposes, start with the Fuel Cell Report.						X		X
http://wwwsrqa.jsc.nasa.gov/issrm/ http://sspweb.jsc.nasa.gov/meeting/RMP/	Links to NASA's R&M Panels for the International Space Station (ISS) Program and for the Space Shuttle Program (SSP).	X	X	X	X	X			X
http://www.hq.nasa.gov/office/codeq/rp1370.pdf	NASA's training manual for elements of interface definition and control (NASA Reference Publication 1370). Has the goal to identify and control the technical detail needed to ensure that flight system elements mate properly during assembly operations on ground and in space.					X	X		
http://www.hq.nasa.gov/office/codej/codejx/jxdocuments.htm#mtdocs	NASA's guides on Reliability Centered Maintenance (RCM) and Acceptance Testing via Predictive Testing & Inspection (PT&I) . These technologies are applicable to any type of system including spacecraft. <u>Note:</u> See CASR link below.		X			X			
http://www.relexsoftware.com	Relax R&M Software. KSC owns Relax. KSC's set up provides Fault Tree Analysis (FTA), Event Tree Analysis (ETA), Failure Modes and Effects Criticality Analysis (FMECA), Reliability Block Diagram Analysis (RDBA), Reliability Prediction (Mil-Hdbk-217 methods, mechanical, and PRISM), Maintainability Prediction , Life Cycle Cost (LCC) and Failure Reporting And Corrective Action System (FRACAS), System Optimization and Simulation (OpSim), Markov Analysis , Weibull Analysis . <u>Contact:</u> Tim Adams (NASA KSC, EA-C, 321-867-2267) for details and network access.				X		X		

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http://www.shodor.org/UNChem/advanced/kin/arrhenius.html	The Arrhenius equation calculator . The Arrhenius Reaction Rate Model models product life as a function of temperature.				X				
http://www.itl.nist.gov/div898/handbook/index.htm	National Institute of Standards and Testing (NIST) 's Engineering Statistics Handbook. The chapter on Reliability describes the terms, models, and techniques used to evaluate and predict reliability.					X	X		
http://www.asq.org/index.html http://www.asq.org/forums/reliability/newsletters/index.html [or try] http://www.asq.org/perl/index.pl?g=reliability and click "Reliability Review."	American Society of Quality (ASQ) . Provides a professional association, professional certification, training, and publications for Reliability Engineers. The second link provides the "Reliability Review," a journal available only to members of ASQ's Reliability Division.					X	X		
http://src.alionscience.com/	System Reliability Center (SRC) . In 2005, the Department of Defense's Reliability Analysis Center (RAC) became SRC. Click "START" to find tutorials on a variety of topics on reliability and related disciplines.		X	X	X	X	X	X	X
http://www.reliabilityweb.com/forms/rw100_list.htm http://src.alionscience.com/pdf/www.pdf	Other web sites on Reliability : The first link is Reliabilityweb.com's top 100 web sites. The second link is Reliability Analysis Center's collection of web sites.			X	X	X	X	X	X
http://www.enre.umd.edu/centers.htm	The Center for Risk and Reliability (CRR) at University of Maryland.			X	X	X	X		
http://www.cnde.iastate.edu/faa-casr/index.html	The Center for Aviation Systems Reliability (CASR) . Provides results that address the inspection needs of commercial aviation industry and lead to safety improvements through their implementation. <u>Note</u> : See NASA's Acceptance Guide on PT&I techniques above.					X			
http://www.dacs.dtic.mil/	DoD's Data & Analysis Center for Software (DACS) . A software information clearinghouse for state of the art software information and provides technical support to the software community.					X		X	
http://members.aol.com/JohnDMusa/	John D. Musa, AT&T Bell Laboratories , on software reliability engineering.			X		X	X		

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http://www.sei.cmu.edu/cmmi/	Carnegie Mellon’s Software Engineering Institute’s CMMI web site. CMMI , Capability Maturity Model Integration, is a process improvement approach that provides organizations with the essential elements of effective processes					X			

- Notes:
1. NASA links are above the bold line. Non-NASA links are below the bold line.
 2. To activate links without using the “Ctrl” key: Go to Tools, Options, Edit tab, and uncheck the item “Use CTRL + Click to follow hyperlink.”